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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

SOOHOO, TONY GLEN

ART UNIT

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1797

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/574,841	Applicant(s) SUGIURA, HIKOROKU	
	Examiner Tony G. Soohoo	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 May 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 1-6 and 13-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>04/06/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Method of purification, claims 1-6 and 13-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 5/30/2008.
2. Claims 7-11 are directed to a mixer device and claim 12 is a corresponding method mixing . Claims 1-6 and 13-20 directed to a purifying method is not directed to the process of making or using the corresponding mixer device, and is not pursuant to the procedures set forth in MPEP § 821.04(B).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 8 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Parent claim 7 points out "a groove" or "a protrusion" or "both" in the alternate scope, however claims 8 and 9 positively recite "the groove and the protrusion" in a positive reference to a scope to include both features. It is unclear if the claims 8 and 9 are attempting to positively point out a provision of "groove" and protrusion" or merely points out details of one of those are chosen in the alternative as in the parent claim 7. Claim 8 and 9 does not positively point out and

establish that the desired protection is to the utilization of “both” the groove and protrusion.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 7-8, 10-12 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Sugimura 5,779,361

7. The Sugimura 5,779,361 ('361) reference discloses a device and a method of mixing whereby a static mixer is provided.

The static mixer comprises a mixer main body (20) which is arranged on the fluid flow path (P1, P1, P1, example fig 1) and is formed in cylindrical shape having a diameter greater than that of the fluid flow path (10a, see example fig 1),

the mixer main body (20) comprising a mixer main body cylindrical unit (21, 20), a hollow inlet disk (22c, example fig 1) unit having a hollow part which is positioned at the end of the mixer main body cylindrical unit (at 22a, 22b, 22c) and serves as an inlet, and a hollow outlet disk unit (23c, 23, 23b) having a hollow part which is positioned at the other end of the mixer main body cylindrical unit and serves as an outlet to 10,

wherein a collision cylinder (generally at 30, 31, fig 1) having a diameter greater than or equal to that of the inlet of the mixer main body and smaller than the inside diameter of the mixer main body cylindrical unit is fixedly housed concentrically in the mixer main body so that the side of the opening of the collision cylinder faces to the inlet,

either a groove (50) or a protrusion (protrusion is read as between the grooves 50), or both is provided on at least one part of the interior face of the mixer main body (see for example groove/protrusion 50 on the vertical face of forming about the outlet 23a) and the surface of the collision cylinder (see example fig 1 groove/protrusions 50 on the vertical face of 31) which have contact with the fluid (see also figures 3-4, and 8, and 9).

Claim 8, note, that groove 50 forms a protrusion between the grooves 50 and are provided on at least one part of the interior side of the bottom face of the collision cylinder (see for example fig 1), the inner peripheral face of the cylindrical part of the collision cylinder (see for example fig 4), the interior face of the hollow inlet disk unit of the mixer main body (see fig 4), and the interior face of the hollow outlet disk unit of the mixer main body (see fig 4).

With regards to claim 10, either the groove/protrusion (50 or protrusions between 5), or both is provided on either the interior side of the bottom face of the collision cylinder or the inner peripheral face of the cylindrical part of the collision cylinder, or both (see figures 3, 6, 8).

With regards to claim 11, note the upstream end of the outlet cylindrical part of the hollow outlet disk unit or the upstream end of the downstream side fluid flow path is protruded into the mixer main body, as seen in fig. 8, at 23a protruding towards the left past the back wall of the main body 20.

With regards to claim 12, the operation of the one static mixer would provide the mixing of fluids with each other.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugimura 5,779,361 in view of Morikawa 5,887,977

10. The Sugimura 5,779,361 ('361) reference discloses a static mixer with the structural limitations as required by the instant claims, and as described above, with the exception of wherein the groove and the protrusion is provided

1) on a plane (read as flat faces) which has contact with the fluid and faces to the flow of the fluid are formed in volute shapes, and

2) the ones provided on a peripheral face which has contact with the fluid and places along the flow of the fluid are formed in spiral shapes.

With regards to the 2nd issue of grooves on the peripheral faces (read as to the circumferential faces of the main body or collision cylinder) , Note that the

Sugiura reference figure 5, has protrusion elements 40a which are twisted thereby forming grooves there between in a spiral fashion peripheral face of the main body cylinder inner surface, column 9, lines 40-53.

Now with regards to the 1st issue of grooves on the , the disclosure to Morikawa teaches that a mixing disc 11, 13 with a center outlet may have tangential grooves in order to provide for rotational angular velocity for

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mixing accuracy and flow rates required. For example, the mixer may include only one sequence of discs, i.e., discs 11/12/13/14/11, then flowing out to the mixer outlet, or three or more sequences of discs.

The mixer is rather simple in its principle, but well-⁵ engineered, requiring a minimum of liquid channel volumes, which in turn contributes to the small dimensions of the mixer. At least some of the discs (e.g., discs 11 and 13 in FIGS. 2 and 4) are provided with grooves which lead to or from the mixing chamber in a tangential direction, thus¹⁰ giving the liquids in fluid streams the rotational angular velocity for spontaneous mixing. A further benefit of the invention is that the discs can be extremely small and that

spontaneous mixing, col 3, line 5-11.

In light of such advantages of a rotational angular velocity, as gleaned by the Morikawa reference, a person having ordinary skill in the art would have found it obvious to provide for *the end disc face about at the outlet of the main mixer body* (see applicant's figure 9 disc 23) with spiral tangential groove volute shapes to cause an added effect of additional spontaneous mixing.

Allowable Subject Matter

11. Not claims are held as being currently allowable of the prior art
12. Applicant is strongly urged to review the scope of claim 9 and review figure 8, wherein the groove and the protrusion is provided on the bottom plane of the collision

cylinder and the groove upon the plane faces to the flow of the fluid which are formed in volute shapes, and consider such limitation and language for subsequent consideration of patentability.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Rath et al 6,112,768 teaches the use of using a groove or spiral spring protrusion to enhance flow

DESCRIPTION OF DRAWING FIG. 1
The rough texture of the inner surface (12b) of both the inlet chamber (14a) and the mixing chamber (16a) creates a swirling action and further turbulence in the fluid passing through the fluid agitator, thereby intensifying the agitation of the fluid. It can be seen, therefore, that the threads (15) of the preferred embodiment serve two complementary functions, firstly in providing the rough texture of the inner surface (12b) of the tube (12), and secondly in facilitating the use of helical spring elements (30) as the means for retaining the flow-disturber (20) in position within the tube (12).

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony G. Soohoo whose telephone number is (571) 272 1147. The examiner can normally be reached on 8AM-5PM, Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Sample can be reached on 571-272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1797

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tony G Soohoo/
Primary Examiner, Art Unit 1797

Tony G Soohoo
Primary Examiner
Art Unit 1797